Amendments to the Specification:

Please amend the title of the invention on page 1 as follows:

--WIRELESS DIGITAL AUDIO ~~MUSIC~~ SYSTEM –

Please amend the paragraph which begins on page 1, line 2 and ends on page 1, line 3, as follows:

-- This utility patent application is a continuation-in-part of U.S. patent application Serial No. 10/027,391, filed December 21, 2001, for "Wireless Digital Audio System," published under US 2003/0118196 A1 on June 26, 2003, now abandoned, which is incorporated herein in its entirety by reference ~~which patent application is pending~~.--

Please amend paragraph **[0005]** as follows:

-- The present invention is generally directed to a wireless digital audio ~~music~~ system for coded digital transmission of an analog audio signal from any music audio player ~~device~~ with an analog headphone jack to a receiver headphone located away from the audio player. Fuzzy logic technology may be utilized by the wireless digital audio music system to enhance bit detection. A battery-powered transmitter may include a headphone plug in communication with any ~~of the previously mentioned~~ suitable music audio source[[s]]. For reception, a battery-powered headphone receiver may ~~apply~~ use embedded fuzzy logic to enhance user code bit detection. Fuzzy logic detection may be used to enhance user code bit detection during decoding of the transmitted audio signal. The wireless digital audio music system [[will]] provides private listening without

interference from other users or wireless devices and without the use of [[wires]] conventional cable connections.--

Please amend paragraph **[0007]** as follows:

--Some aspects of the present invention are generally shown by way of reference to the accompanying drawings in which:

Figure 1 schematically illustrates a ~~schematic diagram representation of the~~ wireless digital audio ~~music~~ system ~~according to and embodiment of~~ in accordance with the present [[the]] invention;

Figure 2 is a block ~~illustrates a schematic~~ diagram ~~representation~~ of [[the]] an audio transmitter portion of the wireless digital audio system of Fig. 1 ~~according to an embodiment of the invention~~;

Figure 3 ~~illustrates a schematic diagram representation of the receiver without the use of the fuzzy logic enhancement according to an embodiment of the invention~~ is a block diagram of an audio receiver portion of the wireless digital audio system of Fig. 1; and

Figure 4 ~~illustrates a schematic diagram representation of the system with the use of the fuzzy logic enhancement~~ is an exemplary graph showing the utilization of an embedded fuzzy logic coding algorithm according to [[an]] one embodiment of the present invention.--

Please amend paragraph **[0009]** as follows:

--Referring to Figures 1 through 3, a wireless digital audio music system 10 may include a battery powered transmitter 20 connected to a portable music audio player or music audio source 80. The battery powered wireless digital audio music transmitter 20 [[that]] utilizes an analog to digital converter or ADC 32 and may be connected to the music audio source 80 analog headphone jack 82 using a headphone plug 22. The battery powered transmitter 20 may have a transmitting antenna 24 that may be omni-directional for transmitting a spread spectrum modulated signal to a receiving antenna 52 of a battery powered headphone receiver 50. The battery powered receiver 50 may have headphone speakers 75[[4]] in headphones 55 for listening to the spread spectrum demodulated and decoded communication signal. In the headphone receiver 50, fuzzy logic detection may be used to optimize reception of the received user code. The transmitter 20 may digitize the audio signal using [[an]] ADC 32. The digitized signal [[that]] may be ~~in communication with~~ processed downstream by an encoder 36. After digital conversion, the digital signal may be processed by a digital low pass filter. To reduce the effects of channel noise, the battery powered transmitter 20 may use a channel encod[[ing]]er 38. A modulator 4[[8]]2 modulates the digital signal to be transmitted. For further noise immunity, a spread spectrum ~~modulation~~ DPSK (differential phase shift key) transmitter or module 4[[2]]8 is utilized. The battery powered transmitter 20 may contain a code generator 44 that may be used to create a unique user code. The unique user code generated is specifically associated with one wireless digital audio ~~music~~ system user, and it is the only code recognized by the battery powered headphone receiver 50 operated by a particular user. The radio frequency (RF) spectrum utilized (as taken from the

Industrial, Scientific and Medical (ISM) band)[[,]] may be approximately 2.4 GHz. ~~And~~ ~~the~~ The power radiated by the transmitter adheres to the ISM standard.--

Please amend paragraph **[0010]** as follows:

~~--A digital signal may be received at antenna receiving antenna 52 and communicated to, e.g., a wideband bandpass filter.~~ [[The]] Particularly, the received spread spectrum signal may [[then]] be communicated to a 2.4 GHz direct conversion receiver or module 56. A frequency shift keying (FSK) modulation/detection technique could be used given a frequency hopping spread spectrum (FHSS) system choice. ~~The direct conversion receiver 56 may provide a means to convert the received signal using timing and synchronization to capture the correct bit sequence embedded in the received spread spectrum signal.~~ Referring to Figures 1 through 4, the spread spectrum modulated signal from transmit antenna 24 may be received by receiving antenna 52 and then processed by spread spectrum ~~demodulated~~ direct conversion receiver or module 56[[2]] with a receiver code generator 60 that contains the same transmitted unique code, in the battery powered receiver 50 headphones. The transmitted signal from ~~transmit~~ antenna 24 may be received by receiving antenna 52 and communicated to a wideband bandpass filter (BPF). ~~The received digital signal may be processed by a demodulator 58 (Figure 3).~~ The battery powered receiver 50 may utilize embedded fuzzy logic [[61]] (as ~~best viewed~~ graphically depicted in Figures 1, 4) to optimize the bit detection of the received user code. The down converted output signal of direct conversion receiver or module 56 may be summed in receiver summing element 58 with a receiver code generator 60 signal. The receiver code generator 60 may contain the same unique wireless

transmission of a signal code word that was transmitted by audio transmitter 20 specific to a particular user. Other code words from wireless digital audio systems 10 may appear as noise to audio receiver 50. This may also be true for wireless signals operating in the wireless digital audio spectrum of digital audio system 10. This code division multiple access (CDMA) may be used to provide each user independent audible enjoyment. The resulting summed digital signal from receiving summary element 58 may be processed by a 64-Ary demodulator 62 to demodulate the signal elements modulated in the audio transmitter 20. A block de-interleaver 64 may then decode the bits of the digital signal encoded in the block interleaver 40. Following such, a Viterbi decoder 66 may be used to decode the bits encoded by channel encoder 38 in audio transmitter 20. A source decoder 68 may further decode the coding applied by encoder 36.

Please amend paragraph **[0013]** as follows:

-- The user code bits in each packet may also be received and detected by a fuzzy logic detection [[61]] sub-system 61 (as an option) embedded in [[the]] head[[set]]phone receiver 50 to ~~provide additional~~ optimize audio receiver performance. For each consecutive packet received, [[the]] fuzzy logic detection sub-system 61 may compute a conditional density with respect to the context and fuzziness of the user code vector, i.e., the received code bits in each packet. Fuzziness may describe the ambiguity of the high bit (1)/low bit (0 or -1) [[bit]] event in the received user code within the packet. The fuzzy logic detection sub-system 61 may measure the degree to which a high/low bit occurs in the user code vector, which produces a low probability of bit error in the presence of noise. The fuzzy logic detection sub-system 61 may use a set of if-then rules

to map the user code bit inputs to validation outputs. These rules may be developed as if-then statements [[61]].--

Please amend paragraph **[0014]** as follows:

--[[The]] [[f]]Fuzzy logic detection sub-system 61 in [[the]] battery-powered headphone receiver 50 utilizes the if-then fuzzy set to map the received user code bits into two values[[;]]: a low (0 or -1) and a high (1). Thus, as the user code bits are received, the "if" rules map the signal bit energy to the fuzzy set low value to some degree and to the fuzzy set high value to some degree. ~~See Figure 4 schematic block 61.~~ Figure 4 ~~schematic block 61~~ graphically shows that x-value -1 equals the maximum low bit energy representation and x-value 1 equals the maximum high bit energy representation. Due to additive noise, the user code bit energy may have some membership to low and high as represented in [[61]] [[of]] Figure 4. The if-part fuzzy set may determine if each bit in the user code, for every received packet, has a greater membership to a high bit representation or a low bit representation. The more a user code bit energy fits into the high or low representation, the closer its subsethood, i.e., a measure of the membership degree to which a set may be a subset of another set, may be to one.--

Please amend paragraph **[0015]** as follows:

--The if-then rule parts that make up the fuzzy logic detection sub-system 61 must be followed by a defuzzifying operation. This operation reduces the aforementioned fuzzy set to a bit energy representation (i.e., -1 or 1) that is received by the transmitted

packet. [[The]] [[f]]Fuzzy logic detection sub-system 61 may be used in [[the]] battery-powered head[[set]]phone receiver 50 to enhance overall system [[10]] performance.--

Please amend paragraph **[0016]** as follows:

--The ~~channel decoder 66 may be a Viterbi decoder. A channel decoder 66 may be in communication with the bandpass filter. A decoder 68 may be in communication with a digital to analog converter or DAC 70 that may convert the digital signal back to an analog audio music signal~~. The next step may process the digital signal to return the signal to analog or base band format for use in powering speaker(s) 75. A digital-to-analog converter 70 (DAC) may be used to transform the digital signal to an analog audio signal. An analog low pass filter 72 may be used to filter the analog audio music signal to pass a signal in the approximate 20 Hz to 20 kHz frequency range and filter other frequencies. The analog audio music signal may then be processed by a power amplifier 74 that may be optimized [[to]] for powering headphone speakers 75[[4]] to ~~optimize~~ provide a high quality, low distortion audio music signal for ~~hearing~~ audible enjoyment by a user wearing [[the]] headphones 55. A person skilled in the art would appreciate that some of the embodiments described hereinabove are merely illustrative of the general principles of the present invention. Other modifications or variations may be employed that are within the scope of the invention. Thus, by way of example, but not of limitation, alternative configurations may be utilized in accordance with the teachings herein. Accordingly, the drawings and description are illustrative and not meant to be a limitation thereof.--

Please amend paragraph **[0017]** as follows:

~~--While the invention has been particularly shown and described with respect to the illustrated and preferred embodiments thereof, it will be understood by those skilled in the art that the foregoing and other changes in form and details may be made therein without departing from the spirit and scope of the invention~~ Moreover, all terms should be interpreted in the broadest possible manner consistent with the context. In particular, the terms "comprises" and "comprising" should be interpreted as referring to elements, components, or steps in a non-exclusive manner, indicating that the referenced elements, components, or steps may be present, or utilized, or combined with other elements, components, or steps that are not expressly referenced. Thus, it is intended that the invention cover all embodiments and variations thereof as long as such embodiments and variations come within the scope of the appended claims and their equivalents.--

Please amend paragraph **[0018]** as follows:

--~~[0017] The~~ A wireless digital audio ~~music~~ system includes a portable audio source with a digital audio transmitter operatively coupled thereto and an audio receiver operatively coupled to a headphone set. The audio receiver is configured for digital wireless communication with the audio transmitter. The digital audio receiver utilizes fuzzy logic to optimize digital signal processing. Each of the digital audio transmitter and receiver is configured for code division multiple access (CDMA) communication. ~~may utilize a battery powered transmitter to transmit a coded digital signal from an existing analog headphone jack of a music audio player device or source to a battery powered headphone receiver without the use of wires. A battery powered digital transmitter may~~

~~include a headphone plug in communication with a standard analog headphone jack on an audio source, such as, laptop and desktop computers, portable compact disc players, portable MP3 players, portable cassette players, etc. The battery powered transmitter adds a unique user code and transmits it to the battery powered receiver headphones where a fuzzy logic detection system may be used to enhance decoding performance.~~ The wireless digital audio system [[will]] allows private ~~listening~~ audio enjoyment without interference from other users or other wireless devices, and without the inconvenience of wires.--